DOCUMENT RESUME

ED 160 282 RC 010 779

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TITLE Old Time Apple Cider Makin': An Outdoor Education Unit.
INSTITUTION Cortland-Madison Board of Cooperative Educational Services, Cortland, N.Y.
PUB DATE Oct 76
NOTE 33p.; Not available in hard copy due to the extensive use of colored paper
AVAILABLE FROM Cortland B.O.C.E.S. Outdoor-Environmental Ed. Program, McEvoy Educational Center, Cortland, New York 13045 ($1.00)

EDRS PRICE MF-$0.83 Plus Postage. HC Not Available from EDRS.
DESCRIPTORS *Activities; *Cooking Instruction; Elementary Education; Food; Health; Illustrations; *Interdisciplinary Approach; Language Arts; *Lesson Plans; Nutrition Instruction; *Outdoor Education; *Resource Materials; Sciences; Social Studies
IDENTIFIERS *Apple Cider Making

ABSTRACT

An illustrated, self-contained packet, the resource materials contained in this guide are designed for adaptation to K-8. The resources and ideas presented here are designed to encourage utilization of the outdoors as a learning resource. While intrinsically multidisciplinary, the activities are particularly adaptable to social studies, science, and language arts. Activities and narratives included in this guide are as follows: a five-page history of apples accompanied by a chart indicating apple variety, flavor and texture, and usage (pie, sauce, etc.); pre-trip lesson suggestions aimed at science, social studies, math, health, and language arts activities; the lesson on making apple cider (mood setting, old time uses of apples, modern apple uses, types of apples and uses, storage, cider making activity, cider considerations, and wrap up); post trip follow up suggestions; a narrative on fruit sprays; a narrative on the virtues of an apple a day, "The Health and Nutrition Story of Apples"; 15 apple recipes; a narrative on making apple cider; a guide to making dried apple faces and dolls; a cross-word puzzle; and special tips to the teacher re: the mechanics of making cider. (JC)

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OLD TIME APPLE CIDER MAKIN': An Outdoor Education Unit

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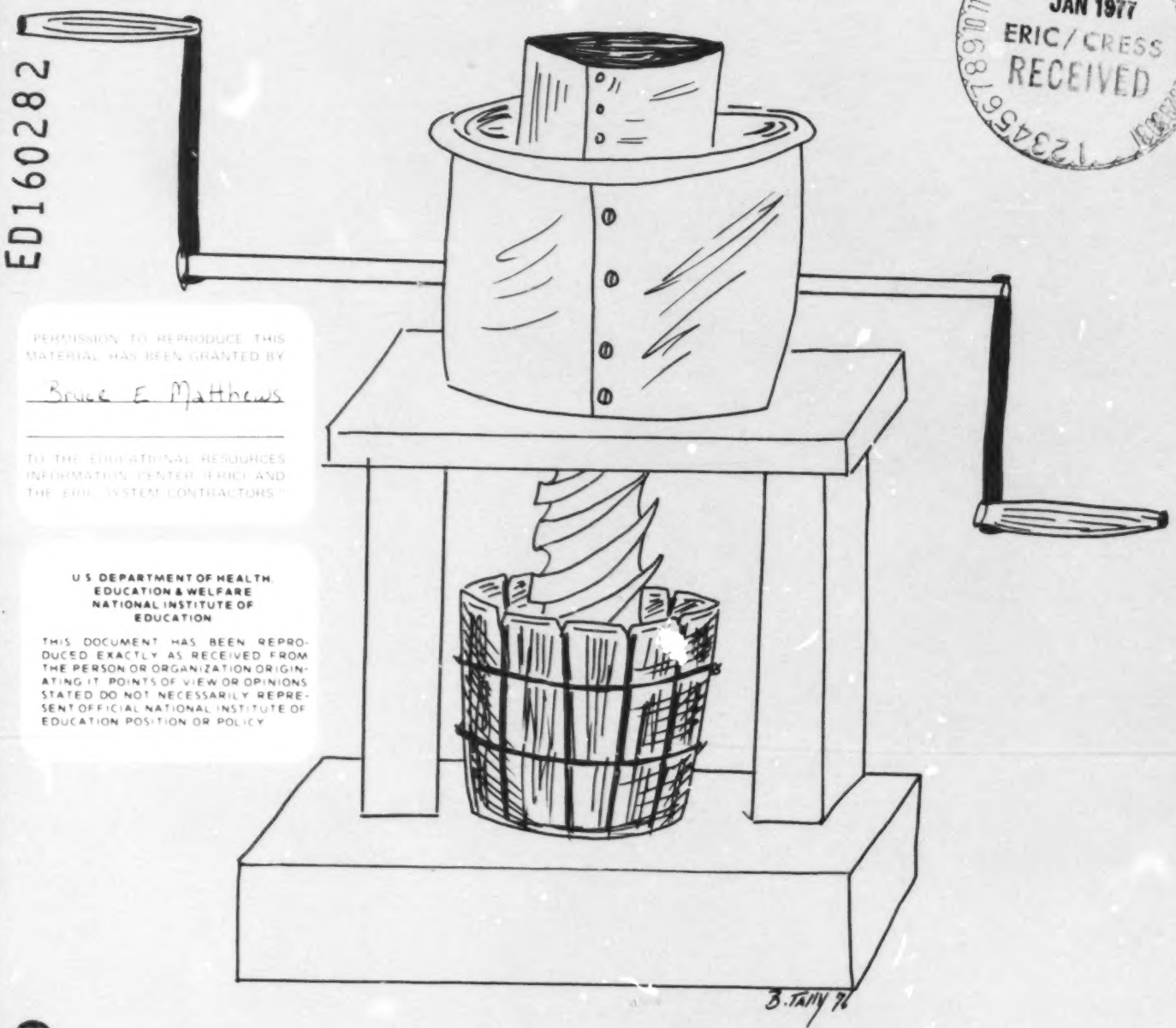

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Bruce E. Matthews, Coordinator
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TABLE OF CONTENTS

INTRODUCTION 1

HISTORY OF APPLES. 2

"KNOW YOUR APPLES" SHEET 6

PRETRIP SUGGESTIONS. 7

APPLE CIDER LESSON 10

POST TRIP FOLLOWUP SUGGESTIONS 13

FRUIT SPRAYS. 16

"AN APPLE A DAY" SHEET 17

APPLE RECIPES 18

"MAKING APPLE CIDER" SHEET 22

DRIED APPLE FACES AND DOLLS 23

APPLE CROSSWORD PUZZLE 24

TEACHER TIPS 25

APPLE PACKET BIBLIOGRAPHY & RESOURCES. 26

CREDITS 28

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INTRODUCTION

CIDER TIME!!

The spicy tang of fresh sweet cider plus the unmistabeable odor of autumn leaves are sure signs that summer is over and the harvest time is here. What better time to experience the outdoors and all it has to offer with a class of motivated students!

The study of apples and apple products is intrinsically multidisciplinary. Particular emphases can be on Science and Social Studies, with plenty left over for Language Arts! There's nothing like combining direct, real life experiences with the educational process to enhance learning. Outdoor Education has as its central focus the provision of these direct learning experiences in the outdoors. This unit, focusing on Old-Time Cider Makin', is guaranteed to motivate the student and please the palate.

The Apple Cider lesson and Resources Packet is another in a continuing effort by the BOCES Outdoor Education Program to provide teachers and educators with resources and ideas for utilizing the outdoors as a learning resource. This packet is self-contained, enabling teachers to conduct the lesson on their own. Copies of this packet are free to teachers in districts participating in this Outdoor Education Program. As always, the Outdoor Ed. Staff can assist in any aspect of implementing this unit.

HISTORY OF THE APPLE

Historians are uncertain about the origin of the cultivated apple, but there is evidence which suggests its origin to be roughly in southwest Asia. This is also the same general area where mankind is said to have originated, and where Biblical historians locate the Garden of Eden (this, of course, is purely speculative).

Archaelogists have found fossils and carbonized remains of apples in prehistoric lake dwellings in Switzerland that are believed to be relics of the Iron Age. Fossilized apples found in excavations indicate that apples were known and used by primitive man long before recorded history, and existed as far west as the Atlantic Ocean, covering most of Europe. Evidence suggests that apples were eaten and preserved by sun drying during the Stone Age in Europe. But these apples did not resemble the large, sweet, crisp apples that we are all familiar with. The fossilized remains of apples and the writing on cave walls indicated that these apples were the equivalent of the small, sour crabapples of today.

Once man started to use symbols to express his ideas, he began to record information about apples. Scientists have found apples mentioned in the early writings of the Chinese and Egyptians, for example.

At the time of the first settlers' arrival in America, there were three species of apples growing wild. All three of these species were similar in size and taste to the crabapple, and were not desirable for eating or cooking purposes.

When the settlers arrived in the New World, they brought seeds from their favorite apples with them. The first apple crops in this country were harvested from trees planted by the pilgrims in Massachusetts, and by the colonists at Jamestown in Virginia.

Apples, for the most part, were not grown commercially. Most colonists had a small orchard of seedlings. The better eating apples and the ones with storage quality were kept for fresh fruit. Much of the crop was made into cider. Apples that were not used up were bartered with colonists who did not have an orchard, or with merchants for needed supplies.

Apples in the Colonial days were America's national food, and cider was the national drink. Colonists relied heavily upon the apple as a versatile food source. Apples, in one form or another, were on the table the year round. Apple orchards were planned to supply fresh eating and cooking apples for each season. By proper planning, an orchard might start bearing fruit in summer and finish in late fall.

There were many varieties of apples in Colonial America that needed to be harvested at a specific time for a specific purpose. The maturity of an apple was determined by the growth of the seed, so an apple was cut open and used as a test.

The apple tree is a symbol of the versatility and character of the American people. The next time you are walking in the woods and come upon an old apple tree, stop and look around. Perhaps you will discover the remains of an old homestead with a cellar where apples once were stored.

Apple seeds were distributed far into the wilderness by traders, Indians and missionaries, and were carried westward by the pioneers. Wild apple seeds were also spread by animals which ate the fruit, but were unable to digest the seeds. This latter dissemenation of seeds accounts for the wild apple trees that many of the settlers found growing in the unsettled areas of New York.

When the pioneers traveled westward they carried apple trees and "scion wood" for grafting. The most famous of these pioneers was a legendary character known as Johnny Appleseed. His real name was Jonathan Chapman, an itinerant missionary and preacher of the Swedenborgian Christian faith.

No single biography of Johnny Appleseed is really complete. Over the years, historians have pulled together bits and pieces of his strange life, but they disagree as to the chronological order.

Little is known of his early life except that he loved nature and that he was very unselfish. He lived frugally, never owned a home, dressed in cast-off clothing that he had taken in payment for apple-trees, and often went barefoot in summer and winter. He traveled throughout the Ohio Valley region, planting and tending trees, and distributing seeds to the early settlers. He would give them away to those who could not pay for them. But he generally sold them for clothing or a fresh supply of cornmeal. His expenses for food and clothing were so minimal that he often possessed more money than he cared to keep, and it was given to some poor family.

The majority of his life was devoted to the work of planting apple seeds in remote places. He gathered his seeds from the cider-presses of western Pennsylvania. After planting his stock of seeds throughout the western frontier, he would return to Pennsylvania for a fresh supply. He was treated with the greatest respect by both Indian and white man.

It is estimated that Johnny Appleseed's labors had literally borne fruit over a hundred thousand square miles of territory.

In the years that followed, many varieties of apples were developed in this country through the process of chance development from bud or seed mutation, and propagation by grafting. Grafting is necessary since apples do not reproduce true from seed. If seeds are planted from an apple that was eaten today, for example, each seed would produce a seedling tree unique from other trees of other seeds in the same apple.

Apple trees thrive almost everywhere on the North American Continent, except in the extreme northern and southern sections. Today, apples are grown in most parts of the United States, with 37 states producing sufficient quantities to be considered as commercial producers. Of these, 5 states produce roughly 2/3 of our annual crop. Certain varieties of apples are better suited to some locales than others. The following is a list of the major apple producing areas in the United States and their leading varieties:

WASHINGTON - About 35,000,000 bushels, and increasing. Leading varieties (including red "Sports") - Delicious, Golden Delicious, and Winesap.

THE APPALACHIAN AREA - (Virginia, Pennsylvania, West Virginia, Maryland, and Delaware) - 30,000,000 bushels. Leading varieties - York Imperial, Delicious, Stayman, Rome, Golden Delicious, Jonathan, and Winesap.

NEW YORK - 22,000,000 bushels. Leading varieties - McIntosh, R.I. Greening, Delicious, Cortland, Rome, Baldwin, Northern Spy and Golden Delicious.

MICHIGAN - 16,000,000 bushels. Leading varieties - Jonathan, McIntosh, Delicious, Northern Spy, Golden Delicious and Rome.

CALIFORNIA - 11,000,000 bushels. Leading varieties - Yellow Newtown, Gravenstein, Delicious, Rome, Golden Delicious and Jonathan.

NEW ENGLAND - 10,000,000 bushels. Leading varieties - McIntosh, Cortland, Delicious, Golden Delicious, Baldwin and Northern Spy.

OHIO, INDIANA AND ILLINOIS - 8,000,000 bushels. Leading varieties - Jonathan, Rome, Golden Delicious, Stayman and Delicious.

NEW JERSEY - 3,000,000 bushels. Leading varieties - Rome, Delicious, Stayman, and Starr (summer apple).

NORTH CAROLINA - Over 6,000,000 bushels and increasing. Leading varieties - Delicious, Rome, Stayman, and Golden Delicious.

OREGON - 2,500,000 bushels. Leading varieties - Yellow Newtown, Delicious, and Golden Delicious.

IDAHO AND COLORADO - 4,000,000 bushels. Leading varieties - Delicious, Rome, Jonathan, and Winesap.

Other states, equally important, but producing smaller volumes, include: Wisconsin, Minnesota, Missouri, Kentucky, South Carolina, Georgia, Utah, New Mexico, and several others.

Apples are highly prized due to their versatility. Apples sold for fresh fruit still constitute the major part of the crop in the United States, but each year more and more apples are being used for various apple products such as juice and cider, canned applesauce and apple slices, baby food, cereals and dried apples. Each year approximately 80-85 million bushels are consumed fresh in the U.S. alone. Roughly 2 million bushels are exported and 60 million bushels are processed annually.

Although a great number of apples are eaten fresh, they also make delicious pies, sauce, jelly, cakes, dumplings, baked apples, salads, pancakes, apple butter, juice, cider and a host of other fresh cooked dishes. Each apple variety has a slightly different flavor and texture. Some varieties are better suited than others due to certain methods of preparation. The chart on the following page lists some of the major varieties and uses of each.(see page 6)

Fall, of course, is the big apple season, but with modern developments in storage, apples are available year round.

In the past apples were packed in bushel baskets or boxes in the producing areas and shipped to storage in the cities and towns. This practice was widely used until about 1940. However, too much time elapsed between the time of harvest and the time the apples were placed in 32-degree storage, and this resulted in reduced storage life of the apple.

In the years after 1940, producers built cold storages on their farms so that fruit could be refrigerated more quickly.

In the 1950's scientists designed a better storage process known as controlled Atmosphere Storage (commonly referred to as CA Storage). Today consumers can enjoy crisp, juicy apples the year round. CA Storage combined cold temperatures with a controlled atmosphere - reduced oxygen supply and increased carbon dioxide - to further slow down the metabolic rate of the fruit in storage.

Today, over 75 million bushels of apples are stored in CA and regular cold storages. Of these, over 17 million bushels are in CA Storage.

Variety	Flavor and Texture	Fresh & Salad	Pie	Sauce	Baking	Freezing	Canning	Main Season
Baldwin	Mild, Firm	Good	V. Good	Excl.	Good	Excl.	Excl.	Nov.-April
Cortland[1]	Mild, Tender	Excl.	Excl.	V. Good	Good	V. Good	Good	Oct.-Jan.
Red Delicious*	Sweet, Mellow	Excl.	Poor	Fair	Poor	Fair	Fair	Sept.-April
Golden Delicious[1]	Sweet, Semi-firm	Excl.	V. Good	Good	V. Good	V. Good	V. Good	Sept.-April
R. I. Greening	Slightly tart, firm	Poor	Excl.	Excl.	V. Good	Excl.	Good	July-Sept.
Lodi	Tart, Soft	Good	V. Good	Excl.	Poor	Good	Good	Aug.
Early McIntosh	Tart, Semi-firm	Fair	Poor	Poor	Fair	Poor	Poor	Aug.-Sept.
McIntosh*	Slightly tart, Tender	Excl.	Excl.	Good	Fair	Good	Fair	Sept.-April
Monroe	Slight tart, Firm	Good	V. Good	Good	Good	Good	Good	Oct.-March
Ida Red	Tangy, Firm	Good	V. Good	Good	Good	Good	Good	Jan.-May
Twenty Ounce	Tart, Semi-firm	Fair	Excl.	Excl.	Good	Good	Good	Oct.-Dec.
Macoun	Mild, Crisp, Firm	Excl.	Poor	Fair	Fair	Poor	Fair	Oct.-Dec.
Northern Spy	Tangy, Tender	Excl.	Excl.	Fair	V. Good	Excl.	Good	Nov.-May
Rome Beauty*	Slightly Tart, Firm	Fair	V. Good	V. Good	Excl.	V. Good	V. Good	Oct.-April
Wealthy	Tart, Soft	Good	Good	V. Good	Fair	Poor	V. Good	Aug.-Dec.
Yellow Transparent	Tart, Soft	Poor	Excl.	Good	Poor	Poor	V. Good	Aug.-Sept.

1. Cortland and Golden Delicious do not turn dark on standing when used in salads; other varieties should be sprinkled with lemon juice to prevent darkening. * McIntosh is a variety which is very adaptable to controlled atmosphere storage. Red Delicious and Romes are also stored in C.A. storage but are not as responsive to this type of storage as McIntosh. C. A. storage permits keeping them in splendid condition until spring or early summer, well beyond the time possible under regular cold storage in ordinary atmosphere.

Prepared by R. Bruce Jones, Extension Field Representative - Marketing
Richard L. Norton, Cooperative Extension Agent, Monroe County

PRE-TRIP SUGGESTIONS

These pre-trip lesson suggestions have been prepared and listed so that the educational value of the lesson itself can be more fully realized. Key concepts, which need to be understood before the lesson takes place, have been identified and included in the pre-trip section. These have been isolated into subject areas for easier understanding; however the multidisciplinary nature of this lesson must not be overlooked.

SCIENCE

1. Go over the fall leaf change processes with the class, gearing to the class level. You may wish to collect pretty leaves and classify as to color, or shape. The next step, of course, is to identify them. (Harlow's Trees Of The Northeast, Cornell's Know Your Trees or Petty's 3-Number Tree Key are all good and available from the Outdoor Ed. Office.) Identification may be difficult without the twig on which the leaf was attached.

Color changes occur when the dominant green chloroplasts die, allowing the other less dominant pigments to take over. This may be due to amounts of sunlight or temperature or a combination of both. The PH of the soil is also a factor in pigment domination, explaining color differences between same species trees.

Leaves fall off when a protective layer of corky tissue grows between the leaf stem (petiole) and the branch. This layer, called the absciss layer, grows all summer and gradually lessens the contact between leaf and stem, until finally the leaf falls off, leaving on the twig at the point of attachment a leaf scar.

2. Apple Ripening Process
   a. Collect and taste apples in various stages of maturity. Why do ripe ones taste better?
   b. What is sugar?
   c. Apples ripen when a combination of factors occur, dealing with temperature, amount of sunlight, etc. Internally, the apples' starch is converted to fruit sugar; tannic acid disappears and is replaced by malic acid, which adds a spicy taste; the pectin becomes soluble and digestible; and the fruit cells soften. At this peak point it is ready to eat.
3. An interesting sidelight is the apple's unique adaptations which maximize its potential for successful propagation and dispersal of species. For the great part of its development, when the seeds are (continued page 8)

not ripe, the apple is camouflage green, blending with the leaves. It is bitter, unpalatable and indigestible. However, when ripe and ready for seed dispersal, it advertises its availability by color and palatability by taste, thus insuring future generations of apples.

4. Pollination considerations - Where do apples come from?
   a. Do trees have flowers?
   b. Discuss the process of pollination
   c. Discuss the insect's importance in pollination
   d. Discuss the role of flowers in plant and tree reproduction.
5. Discuss the different types and uses of apples. (consult chart enclosed in packet) These range from use as muskrat trap bait to tables of Kings. List as many uses as you can.

SOCIAL STUDIES

1. Discuss determination of apple quality and grades.
   a. Quality is determined by the consumer. Grades are regulated by New York law and the U.S. Agriculture Department. Grades are: U.S. Extra Fancy, U.S. #1, U.S. Utility.
   b. Why are grades used?
   c. Why is quality important?
2. Apple picking
   a. To insure quality apples and continued production from the tree, care must be taken when picking.
   b. Apples must be picked with a quick rotating motion, lifting up and toward the trunk. Branches must not be broken off nor apples bruised.
3. History - for an historical consideration of apples, consult the history section of this packet and the cider lesson plan.
4. Cider Mills - for information on old mills, types, and processes. Eric Sloane's Our Vanishing Landscape is very highly recommended.

MATH

1. Discuss units of measure for volume, ie; bushell, peck, 1/2 peck, etc.
2. Discuss metric equivalents.
3. Discuss measures of liquid volume.

HEALTH

A good consideration of apples and health may be found elsewhere in this packet on the "Apple A Day" sheet, published by the International Apple Institute.

LANGUAGE ARTS

1. Definitions: pollination
   pesticide
   insecticide
2. Write a poem or short story about apples in the fall - getting ripe and red, leaf changes, etc.

APPLE CIDER LESSON

As with all of the self-contained Outdoor Education teaching units, this lesson is designed on a multi-grade basis to accomodate as many grades and students as possible. Consequently teachers will wish to adapt this lesson to more specifically meet the educational needs and levels of their students.

The following is a basic outline of a possible lesson centering on old time apple cider makin'! By no means must all of the outlined areas be covered: however, they are presented as related considerations which may be touched upon to enhance the lesson. Some of the topics below will only be listed; more in-depth considerations can be found elsewhere in this packet, or in the resources listed at the end.

Now get set for a real fall treat straight from Mother Nature! !

I. Set the mood

There's nothing that can enhance this lesson more than setting the mood with a short story or description dealing with autumn, old time cider makin', cider and donuts, dry cornstalks and pumpkins, witches and broomsticks. . . .

II. Old time uses of apples

A. Historical (consult history sheet)

1. How did apples arrive in U.S.?
2. Early American uses
   a. apple of some form on table year-round.
      Americans planned orchards to supply apples during entire growing season, and used products all year. They had fresh apples on trees from mid-summer to January.
      1) cider and juice
      2) apple brandy and applejack
      3) pies and crullers
      4) waffles
      5) apple butter
      6) apple cake
      7) applesauce
      8) apple leather (broiled and dried apples)
      9) candy apples
      10) jellies
      11) baked apples
3. Johnny Appleseed Legend

III. Modern apple uses

A. Many of the old recipes and uses have followed us through the centuries. However, there is much less emphasis on apples these days in individual households. What once was a staple food for our ancestors is now an occasional visitor. However, there are probably more apple products in our homes than we think. How many apple products can you name?

IV. Types of apples and uses

A. See chart included in packet

V. Storage

A. Old time

1. Early Americans stored apples individually, and used them for the purposes listed above as needed.
2. Methods
   a. boxed individually in dried sand
   b. wrapped in paper and boxed in grain
   c. buried in cornstalks and charcoal
   d. stored individually on stone shelves in fruit cellar
   e. "hung by the tail," by stem, from a board.
3. Apples have kept for up to two years by this method.

B. Modern storage

1. Home (cool dry place)
2. Commercial (cold, high humidity area)
3. Controlled atmosphere (low oxygen-high CO_2, cold room)

CIDER MAKIN'

This is the high point of the lesson, the area on which most of the student's interest will be keyed.

The cider making aspect can be accomplished at a local press or mill, or in the classroom with a small pressing and grinding unit. The BOCES Outdoor Ed. program has an antique press with which to do this lesson.

A. Grate, grind, smash, or otherwise pulverize the apples to break the cells and create a mash.

B. Place mash in a porous cloth such as cheesecloth, burlap, etc. (do <u>not</u> use sheets - they will tear under pressure)

C. Press mash slowly, allowing time for juice to drain. Collect in bottle.

D. When cider is thoroughly drained, put mash in a compost heap, or feed to livestock.

E. Give a taste to all!!

VI. Cider considerations

A. History

B. Storage

C. Vinegar

D. Hard cider

E. Don't forget to discuss the mechanics and principles about the press itself!!

VII. Wrap-up

A great way to wrap up the lesson, that is in keeping with the flavor of autumn,would be a ghost story. This could provide motivation for some excellent creative writing, and will leave the students with an excited feeling. You could start out with a chilly, moonless autumn night at the cider mill. The old miller was working late, and the creaking of the cider press could be heard outside among the dead leaves being scattered by the gusting wind. . . .

POST TRIP FOLLOWUP SUGGESTIONS

These followup activities are designed to reinforce learnings that may have occurred during the lesson, and to provide an opportunity for further study. These activities are by no means comprehensive and should only serve as a jumping off point for student and teacher creativity. Again, they are broken down into subject areas for easier implementation.

SCIENCE AND HEALTH

1. Discuss pesticides and fruit sprays, pro and con.
   a. Trace the gradual concentrations of pesticides such as DDT or Mires up through the food chain to top level predators such as eagles or salmon. The eagles' survival is threatened, because the high concentrations of DDT ingested weakens egg shells, causing them to be extremely fragile and easily broken. More recently, high levels of Mirex (a pesticide used to kill fire ants in the south and incidently a cancer causing compound) has been found in salmon and other predatory fish in Ontario. This has necessitated a ban on eating those fish, which has practically destroyed the economy of Southern and Western Lake Ontario shore populations. (Mirex has entered the food chain as a pollutant from certain factories in the area)
   b. Consider the effects of not spraying fruit trees: to the individual consumer, farmer and grocer.
   c. Should fruit be washed before being eaten?
   d. What are the effects of pesticides on the human system?
2. List the factors involved in proper apple storage.
3. Apple Cider - discuss the aerobic fermentation (vinegar) and anaerobic fermentation (alchohol) processes.
   a. Consider preservatives (see cider printout from Conservationist)
4. Reproduction and Grafting

   Trees produced from seed will rarely produce the kind of apple from which the seeds came. Consequently, in order to insure that a certain kind of apple will be produced, buds from the desired tree must be grafted on to apple seedlings. The healthy bud is cut from the tree and placed in an incision in the bark of the seedling. The incision is taped or bound closed, exposing only the bud. The bud is nourished by its adopted parent and soon grows its branches. The seedling's other branches are trimmed back, and before long the new tree will produce its foster fruit.

5. Health considerations - see the International Apple Institute's "Apple A Day" sheet.

SOCIAL STUDIES

1. Assign modern uses of apples and products to different class groups. Have them identify where their apple industry is located.
2. Put pins in a U.S. map showing major apple producing areas.
3. Trace or diagram the apple process in pictures, from blossom to table, for various uses of apples.
4. Have the class do a comparative analysis of apples, their uses, and industry between early American and modern times.
5. Collect and exhibit antique apple paraphernalia. Canvass the class and the community for this early Americana - have the class research and write about each piece. Exhibit this in the local bank.
6. Locate old orchards in your area. Try to learn more about them. Was there a cider mill close by?
7. Visit a local orchard and packing plant. The Cornell Orchards conduct tours regularly.
8. Migrant workers are still an important facet in the apple industry. Mechanical pickers for apples are neither widespread nor effective. The migrants follow the seasons north in the spring and south in the fall. The special problems of these people have become quite a social issue. Perhaps a consideration of these would be appropriate.

MATH

1. Convert all measures to metric, including recipe section.
2. Compute ratios
   a. Gallons cider: Bushel apples
3. Compute percentages
   a. What % of apple is cider?

LANGUAGE ARTS

1. Make up stories with the class. Each member tells part of the story going around the room.
2. Write poems or stories dealing with apples, cider, fall, ghosts, etc.
3. Have the children locate stories about or containing references to apples. List them on the board. Have the children read some out loud.
4. Trace apples in American Folklore and legends.

5. Be an apple. Write your thoughts as you blossom, grow, are picked, eaten, etc.
6. Be an apple seedling. Trace your feelings and thoughts as you are transported west with a pioneer family.
7. Write a letter to the National Apple Institute for more information.

ART

1. Make dried apple face dolls. (directions included in packet)
2. Cook some of the apple recipes in class.

FRUIT SPRAYS

Chemical sprays are used to control insect and disease pests of fruit. Some people would consider fruit inedible unless treated with such sprays. Everything we eat or breathe is considered chemical to a certain extent. Most chemicals are poisonous at some level. For example, overdoses of table salt have killed infants. The question that arises is - at what level does a chemical become poisonous?

The Food and Drug Administration attempts to answer this question by a series of feeding tests performed on laboratory animals. Once it has been determined that the chemicals are "safe" in the daily diet for these animals, then a safety factor is agreed upon for human consumption. The FDA establishes a tolerance level of chemical residues on fruit. The FDA is also responsible for inspecting fruit growers and making sure that they maintain the legal tolerance level.

On the other hand, there are those who feel that the use of any inorganic chemicals in food is unnatural and unnecessary. With current findings and regulations by the FDA, many people are becoming skeptical of foods with chemicals or preservatives added. The natural food boom is an illustration of the consumers' desire to know what they are eating and a concern that some chemicals might be harmful. That the FDA is not infallible is illustrated by recent concerns over dyes used in food, particularly red dye #2 and carbon black.

Research on biological control methods has been going on for years. Through this method, insect pests are controlled through natural means such as predation, or inability to reproduce. As research continues, biological controls will increasingly present a more viable alternative, without the far reaching effects of DDT.

"GIVE ME SPOTS ON MY APPLES, BUT LEAVE ME THE BIRDS AND THE BEES, PLEASE!" - Joni Mitchell

An Apple a Day

THE HEALTH AND NUTRITION STORY OF APPLES

By: F. P. Corey, Director of Public Relations
International Apple Institute, Washington, D. C.

Apples are a prominent member of the fruit and vegetable group - one of the four basic food groups. They are relatively low in calories, the food energy unit supplied by carbohydrates, fats and proteins. Apples are for slimming. One average size apple provides only 70 to 80 calories. The energy that is supplied, however, comes from quickly available fruit sugars. Hence one of the prime qualifications for apples for snacks. They fill you up - not out; and provide quick energy.

Apples provide bulk in the diet for the proper functioning of the body's digestive and regulatory systems. Pectin and hemicellulose and the acid-base ratio contribute to this. Pectin and mild acids help fight body toxins, aid digestion and pep up the whole body system. Apples are rich in pectin. Pectin too has been associated with helping to keep cholesterol levels in balance and in this relationship is felt to be significant in helping to reduce the incidence of certain types of heart disease. The high potassium...low sodium ratio in apples is also important in certain cardiac and renal problems as well as in diet for overweight persons.

Studies have shown that persons eating apples regularly have fewer headaches and other illnesses associated with nervous tension. Other studies have demonstrated an association of regular apple consumption with a reduced incidence of colds and other upper respiratory ailments. While much research remains to be done to determine precisely why apples are so healthful, the age-old adage, "An Apple A Day...", is being more and more clearly substantiated.

Apples are the "Smile Fruit" and "Nature's Toothbrush". The mild fibrous texture of the apple and its non-adherent nature; its juice content; its flavorful mouth-watering appeal to accelerate salivary action all combine to make it a wonderful natural aid for cleansing the teeth and mouth of other more adherent-type foods and for giving the teeth and mouth a fresh, clean feeling. Chewing an apple exercises the gums and teeth and facial muscles, too. Studies have shown markedly fewer dental caries, particularly during the six to sixteen caries prone age, when apples are eaten regularly in lieu of excessive amounts of candies and pastries and soft drinks which may leave harmful residues on the teeth for long periods of time.

Dental educational authorities stress the importance of thorough brushing and flossing at least once each day to control plaque buildup on the teeth, but they also encourage apples for snacks and for ending the meal...for better dental health and for better nutrition.

Studies have shown that apple juice for infants, because of its mild nature and low acid content is less irritating than fruit juices of higher acid content, and more readily accepted and digested by infants, and causes less colic and rash-related disorders.

Apples contain modest amounts of nearly all of the most important nutrients and because of their universal flavor appeal, versatility and convenience for use, and near year 'round availability, nutritionists and dietitians rate them high on any list for eating right and staying fit. They are good for your teeth, your stomach, your skin and complexion, your nerves, your smile, your overall good health. That's why we say, Apples are good - and good for you.

APPLE RECIPES

Apples and crushed peanut brittle take to each other like old friends. Delicious, under a cinnamon crumb topping, served warm or cold.

APPLE CANDY CRISP

6 cups (5 to 6 medium) peeled, sliced apples
3/4 cup (½ lb.) crushed peanut brittle
1/4 cup sugar
1/2 teaspoon salt
1 tablespoon lemon juice
1/4 cup water

TOPPING

3/4 cup Pillsbury's Best All Purpose Flour*
1/2 cup sugar
1 teaspoon cinnamon
1/4 cup butter or margarine, melted

OVEN 400° 4-6 SERVINGS

Combine apples, peanut brittle, sugar, salt and lemon juice in greased 8-inch pan or 1½-quart casserole. Sprinkle Topping mixture over apples; drizzle with water. Bake at 400°, 30 to 35 minutes until golden brown and apples are tender. Spoon into serving dishes and serve warm or cold with plain or whipped cream.

TOPPING: In small mixing bowl, combine flour, sugar and cinnamon; add melted butter and mix well.

TIP: 1 can of prepared apple pie filling may be used for filling, omitting sugar and salt.

*For use with Pillsbury's Best Self-Rising Flour, omit salt.

Individual cheese rounds with apple filling middles. A perfect not-too-sweet dessert. An hour and fifteen minutes 'til tart-eatin' time.

APPLE 'N CHEESE TARTS

2 cups Pillsbury's Best All Purpose Flour*
2 cups shredded Cheddar cheese
1/2 teaspoon salt
1/2 cup butter or margarine
1/3 cup milk
1 can (1 lb. 5 oz.) prepared apple pie filling
1/4 cup raisins

OVEN 400° 13 to 24 TARTS

In large mixing bowl, combine flour, shredded cheese and salt. Cut in butter until particles are the size of small peas. Sprinkle milk over mixture, stirring with fork until dough holds together. Form into a ball; wrap in waxed paper and chill ½ hour. Roll out dough on floured surface to 1/8 inch thickness. Cut into rounds with floured 3 inch cutter. Place half of rounds on ungreased cookie sheet. In small mixing bowl, combine apple pie filling and raisins. Place a spoonful of filling in center of each round. Cut a cross in center of remaining rounds and place over filling. Seal edges. Bake at 400° for 12 to 15 minutes until golden brown.

TIP: To reheat, place on cookie sheet and heat in 350° oven for 10 minutes.

*For use with Pillsbury's Best Self-Rising Flour, omit salt.

APPLE PUDDING PIE

1 9" unbaked pie shell
1 1/4 cups strained, cook apples
1 teaspoon lemon juice
2 tablespoon butter
dash of salt
1/2 cup sugar
few shakes of cinnamon
3 shakes of allspice
2 eggs - beaten light
1/2 to 3/4 cups medium cream

Cook apples with as little water as possible. Strain while hot. Add lemon juice, butter, sugar, salt and spices. Mix well until the butter is melted and everything is blended. Ad the eggs and cream. Mix well. Pour into pie shell. Decorate top with strips of pastry, stars of pastry or any design.

Bake at 400° about 40 minutes -- until silver knife comes out clean.

JOHNNY APPLESEED BARS

1 cup sifted all-Purpose flour
1/2 teaspoon salt
1/2 teaspoon baking soda
1 teaspoon cinnamon
1 ½ cups uncooked oats (quick or old fashioned)
2/3 cup packed brown sugar
1/2 cup shortening, melted
1 egg
1 teaspoon vanilla
1/4 cup coarsely chopped pacans
2 cups thinly sliced pared apples

Mix and sift flour, salt, baking soda and cinnamon. Add oats, sugar, shortening, egg and vanilla; beat until smooth; about 2 minutes. Press half of dough in bottom of greased 9-inch square baking pan. Sprinkle pecans over dough. Arrange apple slices over pecans. Roll remaining dough between 2 sheets of waxed paper to form a 9-inch square. Remove top sheet of waxed paper; place dough over filling. Remove other sheet of paper. Press lightly around edges. Bake at 350° for 25 to 30 minutes. When cool, sprinkle with confectioners' sugar.

Cut in bars.

Makes 18 bars.

SPICY APPLE BREAD

3 cups sifted all-purpose flour
1 1/2 teaspoons baking soda
1 1/2 teaspoons salt
1 1/2 teaspoons cinnamon
3/4 teaspoon nutmeg
1/2 teaspoon allspice
1/4 teaspoon ground cloves
3/4 cup shortening
1 1/8 cups packed light brown sugar (1 cup plus 2 tablespoons)
3 eggs
1 1/2 teaspoons vanilla
1 1/2 cups grated pared apples
3 tablespoons cider vinegar plus water to make 3/4 cup
3/4 cup chopped walnuts

APPLE RAISIN STUFFING

1/2 cup minced onion
2 cups diced apples
4 cups lightly packed soft bread crumbs
1/2 cup raisins
3/4 teaspoon salt
Few grains pepper
1 or 2 teaspoons poultry seasoning
2 tablespoons sugar
1/2 cup butter or margarine, melted.

Combine all ingredients; mix well. Makes enough to stuff a 6 to 7 pound capon or 8 to 10 pound turkey.

SPICY APPLE PUDDING

3/4 cup finely chopped suet
1 cup raisins
2 1/4 cups sifted all-purpose flour
1 teaspoon baking soda
1/2 teaspoon nutmeg
1 teaspoon cinnamon
1/8 teaspoon powdered cloves
1/2 teaspoon salt
1 1/2 cups grated pared apples
1 cup molasses
1 egg, beaten

Combine suet and raisins. Mix and sift dry ingredients; add with apples. Stir in molasses; add egg. Turn into 1 1/2 quart greased casserole; set in pan of hot water. Bake at 325° for 1 3/4 hours. Serve hot with plain cream.

Makes 6 servings

Mix and sift flour, baking soda, salt and spices. Cream shortening and sugar. Add eggs 1 at a time, beating well after each addition. Add vanilla. Stir in flour mixture, alternating with grated apples and liquid. Stir in walnuts. Turn into greased loaf pan, 11 1/4" X 4 1/2" or 2 small loaf pans. Bake at 350° for 1 1/4 hours, or until done. Cool on wire rack.

APPLE BRITTLE DESSERT

4 large apples, or
6 medium-small ones
1/2 teaspoon powdered ginger
pinch of nutmeg or cinnamon
1 cup maple syrup
1 cup crushed peanut brittle (divided)
1/2 cup heavy cream whipped

Peel and core the apples. Slice the apples with a fluted vegetable cutter or cut into plain slices. Arrange slices in a baking dish. Combine the spices and maple syrup and pour over apples. Scatter 3/4 cup of the crushed peanut brittle over all. Bake at 350 degrees for 30 to 35 minutes or until the apples slices are tender.

BAKED APPLES SERVES 6

6 apples, medium to large
1/2 cup sugar
2 tablespoons butter

1. Wash, core, and cut a line around each apple midway between stem end and blossom end to allow for expansion, (or cut a 3/4 inch strip from the top oo each).

2. Place apples in pan.

3. Put 1 tablespoon sugar in center of each apple, dot with butter, add a dash of cinnamon or a few cinnamon red hot candies, if desired.

4. Cover bottom of pan with boiling water. Bake in moderate oven 350° about 1 hr., or until apples are tender, basting occasionally.

Variation: Wrap each apple in a square of aluminum foil, fluting top for 1½" opeining. Bake 1 1/4 hrs. at 350°

In custard cups these apples bake,
Crowned with fitting caps of cake.

BAKED APPLE CUPLETS

1/4 cup sugar
1/2 teaspoon cinnamon
6 medium baking apples, peeled and cored
2/3 cup Pillsbury's Best All Purpose Flour*
2/3 cup sugar
1/4 teaspoon baking powder
1/8 teaspoon salt
3 tablespoons cooking oil or melted butter
1 teaspoon vanilla
1 egg

OVEN 375° 6 SERVINGS

Combine sugar and cinnamon. Roll apples in sugar mixture; place in buttered 8-oz custard cups. Spoon remaining sugar-cinnamon mixture in center of apples. In mixing bowl, combine flour, 2/3 cup sugar, baking powder and salt. Combine oil, vanilla and egg; add to dry ingredients; mix well. Spoon about 2 tablespoons of batter over each apple. Bake at 375° for 40 - 50 minutes or until apples are tender.

Serve Warm.

TIP: Reheat by wrapping in foil and placing in 350° oven for 15 minutes.

* For use with Pillsbury's Best Self-Rising Flour, Omit baking powder and salt.

MOLLY'S APPLE DESSERT

5 to 7 apples
1 cup brown sugar
½ cup melted butter or other shortening
½ cup flour
½ cup rolled oats
¼ tsp. salt
½ cup sugar
Dash of cinnamon

Pare, core, and slice apples. Arrange in shallow baking dish. Cover with ½ cup sugar and pinch of cinnamon. Mix remaining ingredients. Cover apples evenly.

Bake at 325° for 30 minutes (until apples are done).

APPLE PIE

2 3/4 - 3 lbs. tart apples
Ground cinnamon
Ground allspice
2 1/4 cups sugar
2 tbsp. butter
Lemon juice (optional)
Pie dough for top and bottom crust - 10" pan

Roll dough for bottom crust and put in pie plate. Fill plate with cut up apples, heaping the pie plate. Add sugar. Shake cinnamon all over top, lightly coating entire surface. Add 15 shakes of allspice the butter and up to 2 tbsp of lemon juice, depending on tartness of the apples.

Roll out top crust. Make air vents. Moisten entire rim of bottom crust. Indent with tines of a fork all around. Sprinkle water over top crust. Bake 10 minutes at 425°. Reduce heat to 350° and bake 40 minutes.

SERVES 8

OLD FASHIONED APPLESAUCE

5 pounds cooking apples
1 cup packed light brown sugar
1 cup apple cider
2 tablespoons lemon juice
1/2 teaspoon nutmeg

Par and core apples; slice in eights. Place in large baking dish. Heat sugar and cider, stirring until sugar dissolves. Remove from heat; add lemon juice and nutmeg; pour over apples. Cover; bake at 350° for 45 minutes, or until apples are soft. Break up with a fork to desired consistency.

Makes about 3 pints

APPLE COBBLESTONE PIE

6 to 8 large apples
Pastry for 1-crust pie
1 cup sugar
3 tablespoons butter or margarine
1 tablespoon lemon juice
1/4 teaspoon nutmeg
1/2 teaspoon cinnamon

Wash apples; pare; cut in quarters. Remove cores. Line 9-inch pie pan with pastry; trim edges; flute. Cut enough thin slices of apple from quarters to cover bottom of pie pan. Place remaining quartered apples on top, close together to look like cobblestones. Add sugar; dot with butter or margarine; sprinkle with lemon juice, nutmeg and cinnamon. Bake in 425° oven for 15 minutes. Reduce heat to 325° bake 20 minutes longer, or until apples are tender.

MAKES 8 SERVINGS

APPLE SOODLE

8 cooking apples
2 tablespoons flour
2/3 cup sugar
1/4 teaspoon salt
2 cups warm water
Nutmeg

Pare and core apples; cut in quarters. Place in layers in casserole, rounded side up. Mix flour, sugar and salt. Add water; stir until smooth. Pour over apples. Sprinkle generously with nutmeg and additional sugar. Bake in 350° oven for 35 to 40 minutes, or until apples are tender but have not lost shape. Serve warm as a meat accompaniment.

MAKES 6 TO 8 SERVINGS.

Making Apple Cider

by Robert L. LaBelle

MAKING cider is really easy, but only after one has gathered the necessary utensils and equipment and has become acquainted with the techniques and pitfalls. Cidering is nothing more than separating the liquid contents from the cells of the apple tissue. This requires rupturing the cells and straining the juicy mixture under pressure. Whole, unpeeled fruit is first grated by a rotary knife or shattered in a hammer-mill. The resulting semi-fluid mash is then confined in a coarse, strong cloth and compressed, preferably in a stack of alternate wooden racks and cotton or nylon cloths which comprise what is called a cheese.

Pressure applied to the "cheese" by a turning screw or hydraulic pump is gradually increased, allowing time for the juice to escape from the mash. It flows out, strained by the porous cloths, and leaves behind a solid cake of pomace. In about twenty minutes, when the pressure on the cheese reaches 50 pounds per square inch or more, 60 to 80 percent of the mash will have separated as a cloudy juice. The normal yield is about 3½ gallons per bushel.

The cider will be anywhere from translucent amber to downright muddy in appearance, depending on how much the mash has darkened with exposure to air and how great the load of suspended solids. The flavor will be like that of fresh apples, to be sure.

Steadily changing with age, the cider will reach its prime at different times for different people. Favorable changes in body, clarity, and flavor soon occur, then give way, in a natural progression, to various stages of fermentation. Individual tastes in cider cover a wide range, though some people appreciate everything from cider "fresh-off-the-press" to that fermented fully dry, whether "still" or bubbly.

People frequently ask what apples make the best cider — but there are many answers to that — or none. Cider usually is pressed from whatever varieties are readily and cheaply available. Certainly, apples vary measurably in sugar content, acidity, and astringency.

The basic apple flavor — difficult to define — varies from the fruity aroma of McIntosh or Cortland through the characteristic "appleness" of Wayne, Northern Spy, or even well-ripened Baldwin and Rhode Island Greening. A more modest essence of apple is offered by Red or Golden Delicious, Rome, or Idared, and again more robustly by the older varieties: Cox Orange, Esopus, Spitzenberg, or Golden Russet. All these flavor notes contribute to drinking pleasure, depending on one's taste. A blend of different types is usually best.

Apples should be mature when harvested so that normal ripening or mellowing will follow. Orchard-run rather than cull or overripe fruit is definitely best. A reasonable amount of bruising probably won't affect cider quality, but rot certainly will. Drops have long been used for cider, but they particularly need spray-washing and sorting. Moldy fruit is especially suspect now that a toxin, patulin, has been associated with it.

The difficulty with making cider at home has been that a small-scale but efficient mill (or crusher) and press haven't been readily available. A good yield of juice depends on rupturing all of the cells in the apple tissue, either in the mill or the press. The fairly light-duty wine-presses just do not work well on apples. A rugged one-bushel press can be constructed by the earnest amateur, and a grater-type mill could also be built, perhaps by purchasing the rotary head ready-made. Plans for this press can be obtained by sending for "Homemade Fruit Juice Press," by D. L. Downing, N. Y. State Agr. Experimental Station Special Report No. 8, July 1972, Geneva, N. Y. 14456. If this seems too complicated or expensive, perhaps you might want to share both costs and construction with three or four neighbors who, like you, want to press cider from their own apples.

Maintaining cider in a stable, drinkable condition also has its problems. To keep it sweet and unfermented indefinitely, it must be pasteurized briefly at about 165° F. and bottled. When pressed from cold, washed fruit in carefully cleaned equipment and then kept under refrigeration, the cider will stay sweet for several weeks without pasteurization, though its flavor will gradually become less attractive. Cider may also be preserved by freezing in plastic containers. But a word of caution: before use, the entire contents should be thoroughly thawed and mixed to obtain the full-strength product.

Chemical preservatives, such as sodium benzoate or potassium sorbate, help protect cider against spoilage but — at effective levels — add their own characteristic flavors. This is especially true of the benzoate. Ascorbic acid added promptly to the mash or freshly-pressed juice will lighten the color. It also provides little more tartness in very ripe fruit and adds vitamin C often associated with fruits, but rather lacking in apples.

Some natural clarification will occur in sweet cider after hours or days, the suspended solids slowly settling out as a gray or brown sediment. The suspended solids can be largely or completely removed by judicious use of a pectic enzyme, which causes more rapid and complete sedimentation. If a high level of enzyme has been used filtering the cider will then provide a sparkling clear, if somewhat thin, juice. A pleasantly translucent product with more body and only a trace of sediment can be obtained by use of a tenth the normal level of enzyme. Then, in place of filtering, the cider is siphoned off and strained through several layers of press cloth. Sediments that remain are discarded or used to make vinegar.

The story would not be complete without a further word about hard cider. Completely natural fermentation without the use of pure yeast culture or added sugar results in an alcoholic beverage (about 6 percent) which has an interesting special status — not being taxable under the IRS wine regulations. It makes a fine dinner drink, somewhere between beer and wine. Please note that to keep the fermentation from progressing to vinegar, oxygen must be excluded.

That's the cider story. Yes, you can make it yourself, but not without the right equipment. Perhaps a better bet would be to find a clean mill using good fruit. It won't be like making your own, but chances are it will be good.

DRIED APPLE FACES AND DOLLS

The Seneca Indians have made dried apple dolls for many years. Much time and care was taken to make these dolls as realistic as possible. Their name for this doll was "Loose Feet," a spirit who makes the wishes of little children come true. They say he was a happy spirit, very old and very wise.

Apple dolls are made in many different sizes, shapes and methods. It is difficult to advise the best method and to supply patterns that will fit. As a result, the instructions here are only general:

Select a good size cooking apple, keeping in mind that the dimensions of the head will shrink 1/3 or more during the drying process. Peel the apple and start sculpting. It is wise to start with the nose since it is the most predominant feature. Sculpture the rest of the head roughly showing the outlines of the eyes and mouth. The mouth cut can be turned down a little to frown or up to smile, depending upon the character you have in mind. A few light cuts may be added as the start of wrinkles, which will further develop during drying.

In order to preserve the apple it is wise to soak it in a saturated salt solution for 45 minutes, or soak in undiluted lemon juice for 1 hour and drain. Following this treatment the apple should be hung on a wire run through the core without touching any other object and left in a warm ventilated place to dry. Apple hands may be made and dried along with the head. Watercolors or rouge may be applied to give color to the features.

Medium weight wire (clothes hanger for example) can be twisted into a rough body outline with body, arms and legs. Enough wire should be left at the neck to be pushed upwards through the dried apple. The size of the body should be proportional to the head. Wrap the wire framework with rags to give it proper proportion. Tie or sew the rags in place.

Using pieces of cloth, dress the doll in fashions of various countries or periods. A hat can be made from pieces of cloth or felt.

APPLE WITH ROUGH CUTS

APPLE WITH DETAIL CUTS

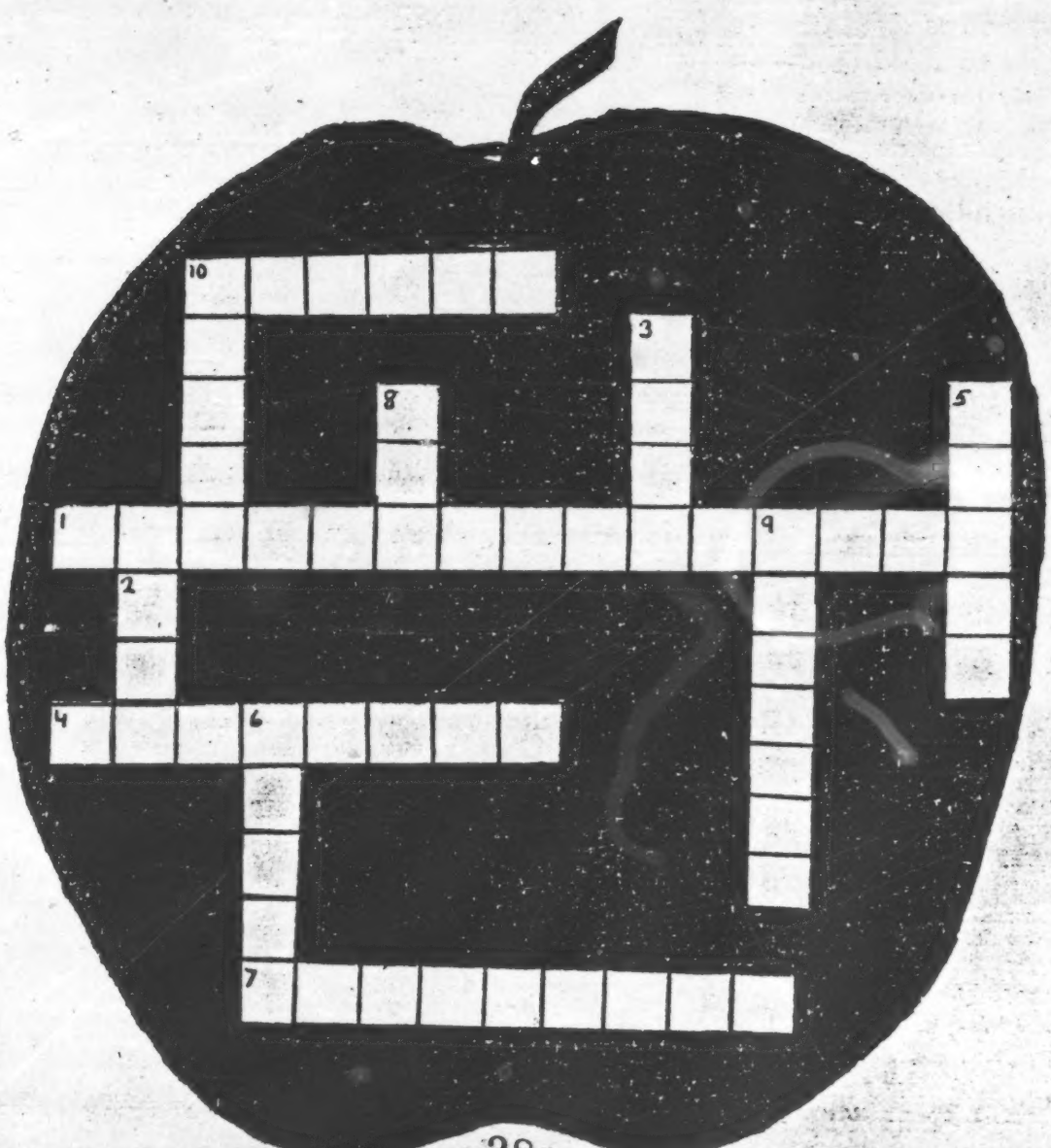
APPLE, DRIED

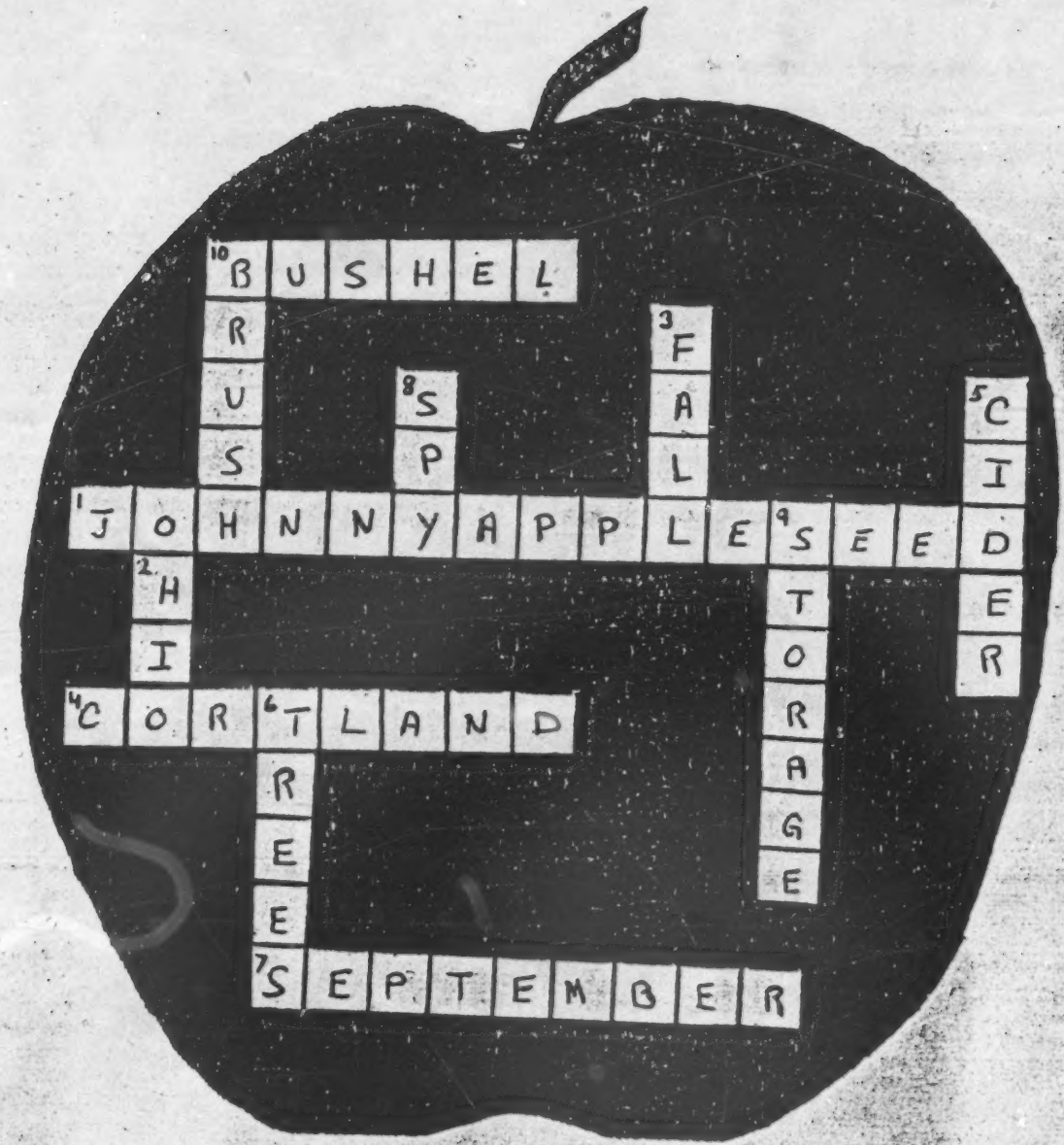
Across

1. A pioneer and legendary man who did more than any other person to plant apple trees in frontier America.
4. A type of apple that has the same name as a neighboring town.
7. One of the big apple months is _____.
10. A unit of volume used to measure fruit is a _____.

Down

2. The region where the legendary man in number one roamed was the _____Valley.
3. The season for apples is _____.
5. An apple beverage.
6. Apples grow on _____.
8. An apple that is tangy and tender is called a Northern ____.
9. Apples are kept fresh in cold _____.
10. In the dental profession, the apple is known as "nature's tooth_____."




10 BUSHEL
RUS
3 FAL
8 SP
5 CIDER
1 JOHNNY APPLE 9 SEED
2 HI
TORAGE
4 COR 6 TLAND
REE
7 SEPTEMBER

TEACHER TIPS

The following considerations may help enhance your lesson:

Any kind of ripe apple-drops, culls, wild, etc. will suffice for cider making. Green or rotten apples should be avoided. Wormy apples may add a little protein to the cider, but that's all!! How about having the students pick the apples? This will really reinforce the strand concept.

The strainer cloths can be made of felt, wool, etc.; but a burlap bag works just as well. Avoid sheets or other light cloth material, for they split easily when pressure is applied. Be sure you rinse the cloth thoroughly to avoid soapy cider.

Apply pressure on the mash slowly, to allow adequate time for the cider to escape.

Be sure you have a collecting bucket beneath the press before you squeeze!!

Watch finger in grinder. Kids fingers and grinders have a natural attraction. By avoiding this, cider will not have a pink tint.

This lesson can and should be adapted to your specific grade level. It was not designed with any level in mind, other than K-8. Use what is appropriate and create in order to fill gaps. Criticisms are welcome.

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FILMS

- Gateway to Health

- The Miracle of Apples

- Story of Johnny Appleseed

FILMSTRIPS

- Billy Meets Tommy Tooth

- How Apples Grow

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FILMSTRIPS - Cont'd.

- Winning First With Teeth

- Story of Johnny Appleseed

CREDITS

The National Apple Institute for providing many valuable resources.

Dave Oaks for much vital legwork.

Barb Brady for her typing dedication.

Barb Talley for the artwork.

Cortland/Madison BOCES for making it possible.

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